Henry Skinner

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ENTOMOLOGICAL NEWS

AND

PROCEEDINGS OF THE ENTOMOLOGICAL SECTION

THE ACADEMY OF NATURAL SCIENCES OF PHILADELPHIA

VOL. XXXIV JULY, 1923 No. 7

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Life-Histories in the Genus Schinia and Allies (Lepid.: Noctuidae) No. 1.

By HENRY BIRD, Rye, New York.

To students and collectors of the Noctuidae, that aggregation of forms which figured in the days of Grote as the "Heliothini" possessed an interest that called to them more than passing note, and they were favorite species with Henry Edwards, Strecker, Grote and Smith, while the work and summarization by Barnes and McDunnough have doubtless provided a compilation of nearly all the representatives of our fauna.

Though the tribal lines laid down by Grote for this grouping which had the old Ochsenheimer genus *Heliothis* as its type is not retained, and their phylogenetic position has been greatly and very properly changed by Hampson, their genera yet form a very distinct aggregation in American lists leading up to the Agrotid types, with which we are wont to associate the heavily spinose tibiae and other features of taxonomic degree.

Referring particularly to the genus *Schinia* Hb. and its near

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ally *Lygranthoecia* G. & R., where a preponderance of the species occur, we now have a series of eighty-four accredited names, with their metropolis indicating a southern or southwestern center of dispersal. Such forms as are common to the Atlantic seaboard have long been familiarly known as adults, but even these, with one exception, it seems, are a perfect blank as to published data concerning their larval histories. Of the greater bulk of western and southwestern species less might be expected and no full description of a larval history has come to our notice.

All these species have a similar larval habit probably in feeding on flower-heads, seed-pods, seeds or ovules, are presumably single-brooded, gaining maturity at a rather late date in the season, so late in many instances that the usual collector of lepidoptera has given up all thought of securing larvae. With such habits some of them might readily become troublesome pests, upon undue increase in their numbers whereby an extension of food requirements proved imperative.

The adults are active moths for their size, may at times make an extended flight, as is indicated in the occasional appearance at the latitude of New York City of more southern forms, sometimes in considerable numbers.

Because of a short adult, egg and larval period in late midsummer and fall, with a major portion of their cycle passed as an underground pupa, they suffer less than some others from that scourge of insect life nowadays—fire. The moths fly readily to light, are to be found resting upon flower-heads or may be seen flying in afternoon hours, apparently feeding upon the nectar furnished by the current, seasonal bloom, which is also being patronized by bees. When the females are resting on flower-heads by day, it is natural to assume they may be associated with their foodplant, and it would appear there is considerable similarity in the color of the foodplant bloom and the predominating hues of the insect.

Doubtless many observations have been made which would help in elucidating the larval associations in this direction, but in being considered of small moment, they have not been

recorded to any extent. So, though the following notes are lamentably incomplete, in view of the facts, no excuses are offered.

Schinia nundina Dru.

On October 12, 1915, my son Junius discovered a mature larva feeding on Goldenrod bloom in a local woodland, and assuming it might be a *Schinia,* pains were taken to check the outcome, which ultimately registered a *nundina* emergence the following season. In the interval since this chance meeting, a yearly outlook has been maintained, with but five or six larval examples detected. One reason for poor success results from the great mass of *Solidago* bloom that decks the countryside, another is that the insect is rather uncommon at this location and finally, the close mimicry of the flower-head they occupy, makes the apprehension of these larvae difficult indeed. So far only *Solidago canadensis* L. seems the preferred one, but we assume this may be a mere chance, incidental to the fact that some examples of *canadensis* from favorable positions bloom earliest and thus happen to be selected by the females at the time of their flight.

The early stage larva likely mines the individual, unexpanded florets, feeding upon the tender ovules and stamens; later it remains in full exposure on the flower-head, solitary and sphinx-like, except that the retracted head and thoracic segments instead of being elevated, are curled under and bent to one side to avoid the stem whereon it has foothold. The yellow body color is similar in hue to the flower and a series of blackish, obliquely transverse markings on each segment correspond, in the full-grown larva, to the interstices between the florets of the flower-head, so that a striking resemblance to its surroundings exists. In curling the head downward there is a duplication of the frequency of the terminal ends of the infloresence to curl under, so this unusual attitude happens, or would seem, to have a clear purpose for protective results.

The feeding is confined to one flower, but the larvae move to several during their later career, and a clew to their whereabouts comes through noting the damaged flowers with their

prematurely expanding pappus, showing where the seeds have been partially cut. It is the seeds that are desired, apparently at all times, such other eating of the bloom being secondary to getting access to them.

The apprehension of larvae of this type is not easy at best and it appears the females oviposit most frequently on the food-plant where it occurs in a narrow fringe, as the borders to a road or pathway, rather than selecting a great expanse of the plant. It may be a coincidence, but roads running east and west and furnishing such borderings, also the southerly side of waste lands where conditions are favorable, have been the situation where these and allied larvae were most frequently met. An explanation may offer that with the prevalent southerly winds of mid-summer the bulk of adults are moving in a northerly direction. With *nundina* the larval period is assumed to be about twenty days.

Larva, penultimate stage: Head normal, smooth, rounded, concolorous, of dull orange hue, the minute ocelli showing as black dots; setae weak; width of head 2 mm. Body cylindric, surface of skin minutely granular but without pile; setae weak, their position is generally indicated by blackish plates but IIIa on the abdominal segments is indeterminate, and due to the granulations, all are indistinctly shown; the leg plate bears a crinkled glistening hair which rather exceeds the others. The crochets of the fourth abdominal prolegs seem to number twenty. The cephalic shield is wider and paler than the head, is slightly elevated from the adjoining surface or hooded, thus permitting a better retraction of the head; on its anterior margin, two black markings are behind the vertex of the frontal lobes, and the lateral edge has a black margin. The general body color is dull yellowish, sometimes with an olive tinge, deepening to dull orange on the dorsum; a broken dorsal line is indicated and a transverse dorsal banding occurs on the anterior portion of each joint, obliquely continued laterad and finishing at the posterior suture above the line of tubercles III and IV, where it blends with a vague spiracular shading, all the marking being contrastingly shown in black. Length 18 mm.

Mature Larva: Similar to preceding stage; color a brighter chrome yellow, fully matching the flower; markings of same pattern and intensity. Length 26 mm. Maturity Oct. 10-15.

The *pupa*, in comparison to the larva, seems very short and small but shows the necessary conformity to the adult. The abdominal joints are retracted, conic, rigid; color, olivaceous brown and not shining like the

common noctuid pupa. A subterranean cell is formed at a depth of six centimeters or more and there is the long pupal period from mid-October to the following August. No parasitism was observed.

Schinia arcigera Gn.

This is the commonest species in the appearance of the adults at light in this locality, but the larva seems equally scarce as *nundina*. It is a week later in appearing and in flight about the late summer flowers, there has been no preference detected to suggest what might be the foodplant. Our meeting with the larva has only been in the last stage, with *Aster puniceus* L. and *A. laevis* L. alone concerned as foodplants.

This larva, when resting, leaves the flower and stretches to full length immediately below the inflorescence on some straight portion of the stem. When feeding, the individual floret is consumed from the side to get at the ovules, while the body, except the head and first segments, is closely appressed to the stem below. In its case there are no transverse markings and the even body color of mars brown blends rather well with the surroundings, as frequently the Aster stems take on a purplish brown tone.

An unexpected feature exists in it being a pilose larva, which was to the writer a distinct surprise.

Mature Larva: Head polished, round, comparatively small, a dull shade of orange tinged with brown; on the top of either epicranial lobe and near the median suture appears a brown marking, and a close examination shows the head to be checkered with fine reddish lines. The front is higher than wide, with the suture dividing the adfrontal space a straight line, and the latter area a mere linear delineation. Width of head 1.5 mm.

The last two segments taper sharply, and in life a noticeable flattening exists, which is lost in the inflated larval skin. The body, though shining and seemingly naked, is found to be covered with a thick pile, the hairs of which are about one-eighth the length of the usual setae arising from the tubercles. Under magnification they are shown to be stiff brownish hairs. The body color is an even shade of pale mars brown, on close inspection found to be mottled and streaked with fine yellowish hair lines, while a well evident, pale yellow, subspiracular longitudinal line, occurs as the chief marking. The cervical shield is prominent, longitudinally marked with two lines composed of black bands split by a yellow line, which in a way are continuations of the head markings. The spiracles are solidly black, the tubercles concolorous

and indeterminate. The hooks of the prolegs number twenty, and the larva attains a length of 26-27 mm. One larva was noted mature and entered the ground Oct. 20.

The *pupa* and its conditions conform to the details given for the preceding species.

Lygranthoecia brevis Grt.

The association of this moth with the common purple Aster, *Aster novae-angliae* L., where its markings were pointed out to so admirably blend with the flower, has been chronicled by Beutenmüller and others for this section, while Cockerell has noted the species resting on the discs of *Helianthus lenticularis*, at Boulder, Colorado.

The pattern and lines in the adult of this species exhibit the basic principles of optical illusion, and it would appear to the writer that the caterpillars show delineations which are even a greater success in the art of camouflage. While the adult in rare instances has been noted in abundance about flowers, but few have ever been taken at Rye, whereas its larva may be found here abundantly when one is conversant with the procedure. An extended time, in which the larvae attain maturity, is noticeable, and in some seasons the first week of November is not too late to secure them. *Aster novae-angliae, A. laevis* and *A. puniceus* serve as foodplants, with the first best adapted to this sturdy caterpillar.

As this stout larva is noted at maturity, lying in crescent form on the denuded receptacle and more or less hidden by the pappus, it is apparent here must be a close relative of a cutworm of the Agrotid type and we see ample confirmation of Hampson's interpretation of the taxonomic characters of the adult, with the radical change he instituted over its earlier list position.

When feeding on the inflorescence of the New England Aster, the first three larval stages are passed within the full-formed flower bud and though it never opens, the damaged ovules send out some premature pappus, advising of the culprit. Two other larvae, a coleopter and micro-lepidopter, are busy here also and their work is very similar in this respect.

Having consumed the ovules in the full-formed bud, the final larval stages are passed on the upper surface of the expanded

flower, the seeds of several being required. Digging under the seeds where they find attachment, the larva succeeds in hiding to a remarkable degree and as this action causes a premature expansion of the pappus, there is soon this characteristic puff, helping concealment. But this is an evanescent screen and the larval markings in dashes and obliques of brown on a drab surface help admirably to fit in with its surroundings, as from its increasing size it must come into fuller exposure.

A parasitic Tachinid fly finds them out, however, and its actual oviposition has been observed on several occasions. One or more pearly white eggs are glued to an attacked host at any point of vantage by the female fly, whose actions are very deliberate, due perhaps to the coolness of the late autumn days or to the functional processes of oviposition. These parasitic larvae doubtless come to rapid maturity and pass the winter as puparia, since oviposition may be as late as October 20. Through the courtesies of the U. S. National Museum, this fly has kindly been determined by Dr. J. M. Aldrich as *Winthemia quadripustulata* Fab.

Local records for the moth cover the first ten days of September, when it is flying in company with *S. arcigera*.

Larva, penultimate stage: Head proportionately small, polished, rounded, the epicranial lobes topped with conspicuous blackish shading; width 1.5 mm. Body covered with fine pile, cylindrical, constricted at segmental sutures, longitudinally lined with numerous brown and fine, crinkled, yellow lines, of which the dorsal and spiracular are prominent, the former dark brown, the latter pale yellowish; underlying shade is sienna brown to pale clay color. Much variation exists in the coloration and the continuity of the lines. Cephalic plate wider than head and marked with four, conspicuous, slightly oblique, black lines. Tubercles indeterminate, IV discernible on abdominal joints, while the leg plate is readily seen; anal plate small and segment reduced. Length 20 to 21 mm.

Mature Larva: Similar to preceding stage, except the color is lighter and the lines are frequently broken at the segmental sutures, which latter produces an effect whereby the larva more closely simulates its surrounding bed of pappus. Width of head, 1.6 mm.; length of body, 28 to 30 mm. Maturity at Rye, N. Y., Oct. 20 to Nov. 8.

The *pupa* agrees with the preceding species in its proportionately reduced size, rigid conic abdominal region, and the subterranean cell as a consequence seems large as compared with the usual Noctuid condition.

Notes on Zygoptera (Odonata) from Maryland, with a Description of Enallagma pallidum, n. sp.

By Francis Metcalf Root, Ph.D., Baltimore, Maryland.

During the summer of 1922 I visited various bodies of water in eastern Maryland in the course of a study of the breeding places of Anopheline mosquitoes. Finding that I had some spare time at my disposal, I turned my attention to the Odonata, but since my time was limited, I was forced to neglect the larger, swift-flying dragonflies to a considerable extent, and spend most of my time in collecting the Zygoptera or damselflies. The records listed in this paper are fragmentary, extending over only a part of the season and including only a few visits to each locality, but even so they are of considerable interest, especially since comparatively little has been published on the Odonata of Maryland.

From the physiographic standpoint, the localities where collections were made can be conveniently classified as follows:

1. Small, rapid streams.

Gwynn's Falls—a small stream just west of Baltimore, running through Hillsdale and Windsor Hills before entering the city itself. Visited May 30, June 23, 29, July 5, 10, Aug. 1, 16, 22, 30, Sept. 5, 9, Oct. 6, 24.

Herring Run—a small stream north-east of Baltimore running through an area reserved as a park. Visited July 21.

Small Streams with a similar fauna were also incidentally noted at Glenburnie, Homewood, Lake Roland and Ten Hills.

2. Sphagnum bogs.

Beltsville—the Powdermill Bogs, about two miles west of Beltsville, between Baltimore and Washington. Visited June 10.

Glenburnie—a pitcher-plant bog near the town, on the Annapolis Short Line, between Baltimore and Annapolis. Visited June 22.

3. Small, artificial ponds.

Homewood—several small ponds on the grounds of the Johns Hopkins University. Visited July 3, Aug. 9.

Hillsdale—north-west of Baltimore. A small pond resulting from the disuse of an old mill-race. Visited June 23, July 5, 10.

Columbia Ave.—several small ponds in a disused brick-yard in south-west Baltimore. Visited June 12, July 15.

4. Large ponds and lakes (mostly artificial).

Glenburnie—a large boggy pond formed by the damming of Sawmill Creek. About one mile north-east of the sphagnum bog already mentioned. Visited Aug. 4.

Ten Hills—a large pond about four miles west of Baltimore. Formed by damming a branch of Dead Run. July 24.

Lake Roland—a large lake, a reservoir of the water-supply system, about four miles north of Baltimore. July 13, 17.

Salisbury—in Wicomico County, on the Eastern Shore. Collecting was done at three mill-ponds north and north-east of the town, formed by damming the Wicomico River. Visited June 15, July 26, 27.

5. Brackish water ponds and bays.

Sparrows Point—seven miles south-east of Baltimore. Collections made in a bay of Jones Creek. July 6, 7.

Magothy River—Collections were made along the shore of the river near its mouth and in a large brackish pond connected with the river. The locality is about five miles north of Annapolis. July 31, Aug. 15, 21, 29. Sept. 4.

The following list gives the species of damselflies which were encountered, followed by the description of a new species.

AGRION MACULATUM Beauvais.—Common at all small streams visited between June 23 and Oct. 24.

HETAERINA AMERICANA Fabr.—First seen at Herring Run, July 21. Common at Ten Hills, July 24, and at Gwynn's Falls from July 29 to Oct. 24.

LESTES FORCIPATUS Ramb.—Homewood, Aug. 20, several specimens.

LESTES RECTANGULARIS Say.—Found near all small ponds from June 12 to Aug. 9.

LESTES VIGILAX Hagen.—Salisbury, July 27, one male.

ARGIA APICALIS Say.—Common about small streams (Gwynn's Falls, Herring Run, Ten Hills) and large ponds (Salisbury, Ten Hills, Lake Roland) on all visits between June 15 and Sept. 9.

ARGIA BIPUNCTULATA Hagen.—Common at sphagnum bogs (Beltsville, Glenburnie).

ARGIA MOESTA PUTRIDA Hagen.—Fairly common along small streams on all visits between June 29 and Oct. 24.

ARGIA SEDULA Hagen.—Common along Gwynn's Falls, June 23 to Sept. 9.

ARGIA TRANSLATA Hagen.—Not rare at Lake Roland, July 13 and 17.

ARGIA VIOLACEA Hagen.—Next to *Ischnura verticalis*, the most widely-distributed damselfly in this area. Found along small streams (Gwynn's Falls, Herring Run, etc.), small ponds (Homewood, Hillsdale), large ponds (Salisbury, Ten Hills, Lake Roland) and even near brackish water (Magothy River) from June 15 to Oct. 24.

ENALLAGMA ASPERSUM Hagen.—At small ponds, Homewood, July 3, Aug. 9, and Hillsdale, July 10.

ENALLAGMA CIVILE Hagen.—Large ponds, Salisbury, June 15, and Ten Hills, July 24.

ENALLAGMA DURUM Hagen.—Very common about brackish water on all visits.

ENALLAGMA EXSULANS Hagen.—Common along small streams on all visits between May 30 and Sept. 9.

ENALLAGMA GEMINATUM Kellicott.—Common about large ponds at Glenburnie (Aug. 4) and Salisbury (June 15, July 26-27).

ENALLAGMA HAGENI Walsh.—Small pond, Hillsdale, June 23, one male.

ENALLAGMA PALLIDUM new species.—Salisbury, July 26, one pair in copula and one male.

ENALLAGMA VESPERUM Calvert.—Salisbury, July 26-27, several specimens.

ENALLAGMA SIGNATUM Hagen.—Salisbury, June 15, July 26-27, Sparrows Point, July 6-7, and Magothy River, all visits.

ENALLAGMA TRAVIATUM Selys.—Not uncommon, Salisbury, June 15, July 26-27.

TELAGRION DAECKII Calvert.—One male, Salisbury, July 26.

NEHALENNIA GRACILIS Morse.—Sphagnum bog at Glenburnie, June 22, fairly common.

AMPHIAGRION SAUCIUM Burm.—Common at sphagnum bogs (Glenburnie, June 23 and Beltsville, June 10).

ISCHNURA POSITA Hagen.—Homewood, Aug. 9. Common at large ponds at Glenburnie, Aug. 4, and Salisbury, June 15, July 26-27.

ISCHNURA RAMBURII Selys.—Common at Magothy River on all visits.

ISCHNURA VERTICALIS Say.—Common about all small streams, small ponds, and large ponds from June 15 to Sept. 9.

Enallagma pallidum new species.

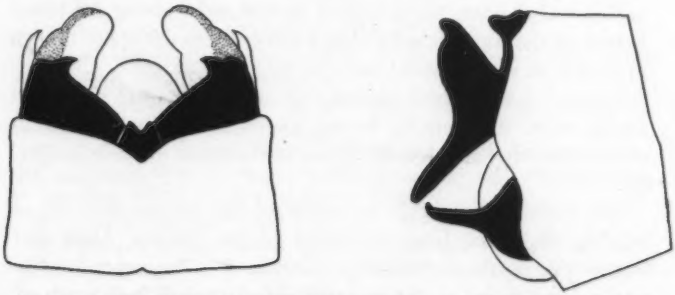
♂.—Pale blue with black as follows: a mid-basal dot on the labrum, a basal band connected with two spots laterally on the nasus, a short transverse isolated stripe a short distance ventral to the median ocellus, which the blue attains, and most of the vertex, leaving the following pale blue spots: two large post-ocular spots, a transverse bar along the posterior margin (not or barely connected with post-ocular spots), two small triangular spots between the median ocellus and the two lateral ones (in one male these two spots are connected with each other and with a small oblong spot between the two lateral ocelli), and two slightly larger triangular spots just external to the lateral ocelli. Second antennal segment black with a bluish spot on ventral surface.

A pair of curved black stripes, connected with a transverse band along posterior margin, on middle lobe of prothorax, an oblong spot dorsally on each lateral lobe. Mid-dorsal thoracic stripe divided into three narrow black stripes by two narrow pale blue areas; none of these three black stripes wider than one-sixth of the width of a mesepisternum.

Humeral stripe distinct above, ending in a fork on dorsal margin of mesinfraepisternum below, narrow and somewhat indistinct between and having adjacent to it a circular black spot on the anteroinferior angle of the mesepimeron. A short black line at upper end of each lateral thoracic suture.

Abdominal segments 1 to 7 black dorsally, except that the posterior margin of 1 is pale blue, the black on 2 is shaped like a spear-head pointing anteriorly, and there are interrupted pale blue basal bands on 3 to 7. Segments 8, 9 and 10 are all pale blue, except for very narrow transverse black lines at base of 8 and at base and apex of 10.

Superior appendages dark brown. Viewed from above, the upper branches are slightly divergent, the lower branches convergent. Upper branch short and stout, with large ante-apical tooth. Lower branch broad and blade-like, thickened externally and thin internally. Viewed



Dorsal and right lateral views of the male appendages of *Enallagma pallidum* n. sp. Camera lucida outlines.

in profile, upper and lower branches appear about equal in length, upper branch stout with a notch just below tip, lower branch slender. Inferior appendages slightly shorter than superiors, slender, almost straight, with a small hook at tip (see text-figures).

Wings hyaline, pterostigma brownish, light-bordered, surmounting less than one cell. Costal margin longest, proximal shortest, distal shorter than posterior. Arculus distal to second antecubital at a distance shorter than the length of the upper limb of the arculus, its limbs sub-equal. Upper side of quadrilateral about one-half of lower side in fore wings, more than one-half of lower side in hind wings. Inferior sector of triangle arises very slightly in front of submedian crossvein (at a distance shorter than the length of the crossvein itself) and ends at about the level of origin of the nodal sector. Superior sector of triangle ends between levels of origin of nodal and ultranodal sectors. Submedian crossvein between first and second antecubitals, nearer to second. fore wings with about nine postcubitals, hind wings with about eight.

The nodal sector arises nearest the fifth postcubital in fore wings (fourth in one wing out of four) and nearest the fourth in all hind wings. Ultranodal sector arises two cells proximal to the inner brace vein of the pterostigma in fore wings and one cell proximal in hind wings. Three antenodal cells in both wings.

Dimensions—abdomen 26 mm., hind wing 17 mm.

♀.—Pale greenish blue and black. Markings as in the male, except that the humeral stripe is ill-defined and reddish brown, there is a brown line on the entire length of the second lateral thoracic suture, and the anterior two-thirds of abdominal segment 8 has a wide dorsal stripe of black, fully four-fifths as wide as the segment in dorsal view. There is a narrow transverse basal brown stripe on 9, interrupted mid-dorsally, but no dark line at apex of 10.

Wings as in the male, but the pterostigma is decidedly paler and has the distal margin sub-equal to posterior.

Dimensions—abdomen 26 mm., hind wing 18 mm.

This species differs from *E. traviatum* by its three, narrow, mid-dorsal thoracic black stripes, by the male having the lower branch of the superior appendages sub-equal to the upper branch in profile view, abdominal segment 10 pale blue, etc.

From *E. antennatum,* whose male appendages are similar in profile view, it differs by having abdominal segments 8 to 10 almost entirely pale blue, by its narrower black thoracic stripes, etc.

One male and one pair in copula of this species were taken on July 26 at the large mill-pond of the Electric Light and Power Co. north of Salisbury, Maryland. The exact locality was a small cove, on the east side of the pond, just north of the railroad trestle which crosses it. At first sight, the slender form and pale blue color of the specimens reminded me of *Telagrion daeckii,* of which I had just taken a fine male at a neighboring pond. When I came to actually compare the two, however, the smaller size and the shape of the male appendages showed at once that they were distinct. Later, being unable to identify the specimens myself, I sent one of the males to Dr. P. P. Calvert, who informed me that it was a new species of *Enallagma,* most closely related, apparently, to *E. traviatum* Selys. I wish here to express my very great indebtedness to Dr. Calvert for his kindness in giving me this information.

I have requested Dr. Calvert to deposit the *type male* and *allotype female* of this species in the collection of the Philadelphia Academy of Natural Sciences. The other male is retained in my own collection.

Corrections to the "Annotated List of the Diptera (Flies) of Oregon."

By F. R. Cole, Redlands, California.

The writer and Prof. A. L. Lovett published a list of the Diptera of the State of Oregon in the *Proceedings of the California Academy of Sciences,* volume XI, December 14, 1921. Since the publication of this list our attention has been called to several mistakes in the paper. We are indebted to Mr. S. B. Freeborn, Mr. C. W. Johnson, Dr. J. M. Aldrich and Dr. C. H. T. Townsend for suggestions and corrections. The numbers used in the original list are referred to here for convenience. There are a few typographical errors to be noted.

40.—*apernax* should be *spernax*.

46.—"at *clavipes*" should read "as *clavipes*."

81.—*Anopheles occidentalis* D. & K. is the same as the European *maculipennis*, according to Edwards.

84.—The name *Theobaldia* is preoccupied and *Culiseta* should be substituted.

85.—*Culiseta consobrina* (Desv.) is synonymous with *Culex pipiens* L. and according to S. B. Freeborn, the species has been confused with *C. impatiens* (Walk.) and *C. inornatus* (Will.).

87.—*Culiseta inornata* (Will.) should be *inornatus*.

88.—The original description of *Culiseta sylvestris* (Theob.) was made under the genus *Culex*, later referred to *Aedes* and now considered synonymous with *Aedes vexans* Meig.

89.—According to Freeborn, *Culiseta stigmatosoma* (Dyar) belongs in the genus *Culex*.

234.—This species is not *costalis*, but is an undescribed form that will be considered in a revision of the Therevidae by the writer, now in press.

236.—This is not *notata*, an Atlantic coast species, but is a variety of the undescribed form mentioned above.

505.—*Syrphus americanus* is evidently preoccupied by the name used by Swederus in 1787 for a different Syrphid, possibly *Eristalis flavipes*, according to C. W. Johnson (see Can. Ent., Feb., 1919, p. 32). Mr. Johnson has proposed the name *wiedemanni* for the species generally known as *Syrphus americanus* Wied.

550.—*Eristalis meigenii* Wied. is a South American species, according to data furnished some years ago by Knab; our species is *Eristalis brousi* Will.

I am indebted to Dr. C. H. T. Townsend, now in Sao Paulo, Brazil, for a long list of corrections of names of the muscoid

flies in the Oregon List. Some of the suggestions and corrections may not be in accord with the views of other workers in the group, but they are nevertheless valuable and are greatly appreciated by the writer, whose knowledge of this difficult group is limited. Dr. Townsend has just completed a Manual of the Muscoid Flies of the World and believes that nothing but restricted genera will be found useful in the study of Muscoid forms and that they cannot be classified like other diptera.

620.—Probably *Bogeria fasciata* Swenk, according to Townsend, who states that *fasciata* Swenk, *fontinella* Clark and *emasculator* Fitch are all three distinct species.

621.—The holotype of *lepivora* Coq. is *Bogeria princeps* Aust., the allotype *Atrypoderma americana* Fitch.

623.—*Cistogaster immaculata* Macq., not *Gymnoclytia.*

625.—Townsend places *fuliginosa* R. D. in the genus *Rhodogyne.*

629.—Probably *Myiophasia oregonensis* Towns. and not *M. aenea* (Wied.).

631.—*Euadmontia pergandei* Coq., not *Hyperecteinia.*

632.—Townsend places *retiniae* Coq. in *Urophyllopsis.*

635.—The holotype is *Methypostena barbata* Coq., and according to Townsend, *Hypostena* is a synonym of *Dexia* Meigen, both having the same genotype, and is far removed from *Masicera.* Aldrich recently called the writer's attention to the fact that the species belonged to the European genus *Arrhinomyia,* but Townsend can see a distinction between the genera, although they are closely allied. *Torytachina, Odontosoma* and *Medina* are all closely related to *Arrhinomyia* and form a natural group.

636.—Townsend places *pristis* (Walk.) in *Anaporia.*

637.—The species is said by Townsend to be *Uromacquartia halisodotae* Towns., not *Oxydexia acuminata* Bigot!

638.—*Leskia gilensis* (Towns.) is placed in *Sipholeskia.*

639.—*Leucostoma atra* Towns. is placed in *Paradionaea.*

640.—Townsend places this form as *Galiathocera antennalis* Coq.

642.—*Clytiomyia atra* Coq. is placed in *Trichoclytia.*

643.—*Dionea nitoris* Coq. is placed in *Neodionaea.*

644.—There are several species of *Xanthomelana* in the west.

646.—*Heteropterina nasoni* Coq. is placed in *Nasonimyia.*

647.—Townsend states that the form called *Paraplagia spinulosa* (Big.) is probably *Euptilopareia erucicola* Coq.

648.—This is a species of *Voria.*

650.—Townsend thinks this species distinct from *trilineata.*

652.—*Ocyptera dosiades* Walker is placed in *Neocyptera.*

653.—*Panzeria ampelus* Walker is placed in the genus *Ernestia* by Tothill (Can. Ent., Sept., 1921). Townsend considers *Ernestia* to be

tribally distinct and would place the species in *Varichaeta*, but it is doubtful if this genus is valid.

655.—*Gymnochaeta alcedo* Lw. is placed in *Chrysotachina*.

656.—*Exorista futilis* O. S. is placed in *Euexorista*.

657.—The form called *Exorista vulgaris* (Fall.) is placed by Townsend as *Phryxe hirsuta* O. S. or a new species.

658.—Perhaps *Neophorocera edwardsii* Will.

659.—Townsend says, "no telling what genus."

660.—Aldrich agrees with Townsend that *Phorocera saundersii* Will. should be placed in the genus *Madremyia*.

661.—*Frontina frenchii* (Will.) is placed in *Achaetoneura*.

662.—The form determined as *Tachina mella* Walk. is said by Townsend to be a species of *Exorista*.

663.—*Tachina robusta* (Towns.) is placed in *Tachinomyia*.

664.—The form determined by Aldrich as *Tachina rustica* Fall. is *Eribea spinulosa* Towns., according to Townsend.

665.—*Blepharipeza adusta* is placed in *Rileymyia*.

667.—Townsend thinks this is not *Winthemia quadripustulata* (Fabr.) but another species of the genus.

668.—*Metachaeta helymus* (Walk.) should be *M. atra* Coq.

669.—*Metopia leucocephala* (Rossi) should be *M. luggeri* Towns. The latter species is made a synonym of *leucocephala* in the Aldrich Catalogue.

670.—*Hilarella fulvicornis* (Coq.) is placed in *Euhilarella*.

671.—*Brachycoma sarcophagina* (Towns.) should be left in the genus *Laccoprosopa*, where it was described.

672, 673 and 674, according to Townsend, should not be called *Gonia*, but *Salmacia*.

675.—Townsend says of this form, "no telling what genus or species."

676.—*Cuphocera furcata* (v. d. W.) is placed as a species of *Sphyricera*.

677.—The form called *Peleteria robusta* (Wied.) is *Sphyromyia malleola* Bigot.

679.—Townsend's splitting of the genus *Echinomyia* is rather difficult to comprehend. *E. algens* (Wied.) is placed in his genus *Eularvaevora*.

680.—*Echinomyia dakotensis* is placed in *Larvaevoropsis*.

681.—*Echinomyia decisa* (Walk.) is placed in *Pararchytas*.

682.—*Echinomyia hystricosa* (Will.) is placed in *Protodejeania*.

683.—*Epalpus bicolor* (Will.) is placed in *Xanthoepalpus*.

684.—*Epalpus signiferus* (Walk.) is placed in *Argentoepalpus*.

685.—*Bombyliomyia abrupta* (Wied.) is placed in *Bombyliopsis*.

686.—The form called *Jurinella soror* (Will.) is a species of *Eublepharipeza*, according to Townsend.

687.—Townsend gives *Dinera futilis* Smith for this species, but this is a manuscript name, according to Aldrich, although used in literature a time or two.

688.—Townsend says this species is probably not *leucozona*.

690.—For the species given as *Trixa* (not *Trixia*, a misprint) *gillettei* Towns., Aldrich did not give any definite genus. Townsend has established the genus *Arctophyto* for the species. The species is correctly determined, as Aldrich has *gillettei* from the type locality and has examined the type.

Townsend has established many new genera among the ruins of the old genus *Sarcophaga*. To the writer's eyes many of the forms separated by Townsend are truly congeneric, but possibly the muscoid viewpoint will have to be attained first, as suggested by Townsend.

691.—Townsend puts *Sarcophaga aculeata* Aldr. in the genus *Acridiophaga*.

693.—*S. cimbicis* Towns. is placed in *Boettcheria*.

694.—*S. elcodis* Aldr. is placed in *Eleodiomyia*.

695.—*S. haemorrhoidalis* (Fall.) is placed in *Stephanostoma*.

696.—*S. helicis* Towns. is placed in *Helicobia*.

697.—*S. hunteri* Hough is placed in *Protodexia*.

698.—*S. kellyi* Aldr. is placed in *Kellymyia*.

699.—*S. pallinervis* Thoms. should be *Euravinia communis* Park.

700.—*S. planifrons* Aldr. is placed in *Miltoravinia*.

703.—*S. sinuata* Meig. is placed in *Sarcotachinella*.

705.—*Megerlea rufocaudata* Big. is placed in the genus *Tephromyiopsis*.

707.—*Cynomyia cadaverina* Desv. is placed in the genus *Cynomyopsis* and Townsend states that the form listed is more likely to be a western species of the genus.

708.—*Calliphora erythrocephala* is placed in the genus *Musca* by Townsend, but this change cannot be made if *domestica* is fixed as the type of *Musca*.

711.—There is some difference of opinion as to the placing of the three species, *regina* (Meigen), *terrae-novae* Desv. and *azurea* (Fall.). Rodhain and Bequaërt put all of them in the genus *Phormia* and Aldrich is inclined to this view. Bezzi in a recent paper accepts *regina* as the genotype and considers the other species distinct from it. Townsend states that *azurea* is the genotype, putting *regina* in *Euphormia* and *terrae-novae* in *Protophormia*. So the matter rests largely on the correct designation of the genotype of the genus *Phormia*.

714.—Townsend places *cornicina* in *Orthellia*. The fact is now known that *cornicina* (Fabr.) has never been introduced from Europe and that our species is *caesarion* Meigen. This has been proven by examination of the European types.

716.—The species determined as *Mesembrina resplendens* Wahlberg is said by Townsend to be *Eumesembrina latreillei* R. D.

717.—Townsend places *Musca domestica* in *Promusca*. Most dipterists

will not accept this and it is understood that the International Commission on Zoological Nomenclature will vote to fix the type of *Musca* as *domestica*, as a *nomen conservandum*.

719.—*Lyperosia irritans* L. is probably preferable to *Haematobia serrata* Desv.

On page 317, figure 38, *fenestradis* should be *fenestralis*.

857.—According to C. W. Johnson, the species *Chaetopsis aenea* is misunderstood, the typical form being taken only from salt and brackish marshes of the Atlantic and Gulf Coast. The species taken in Oregon is probably *C. massyla* Walker, which Johnson has from Berkeley, California.

949.—*Leucopsis* is a misprint for *Leucopis*.

950.—This species is *avicularia* (L.).

New North American Hesperiidae (Lepid.).

By A. W. Lindsey, Denison University, Granville, Ohio.

During the Fall of 1922 Mr. W. C. Dukes, of Mobile, Alabama, sent me a number of specimens of skippers which included a fine new species and an extremely dark form of *dion* which I believe to be worthy of a racial name. One specimen of the new species was also sent to Dr. Wm. Barnes, at Decatur, Illinois, and was placed as new by Mr. Benjamin before my specimens had reached me. In view of my interest in the family Hesperiidae and my possession of three other specimens, Dr. Barnes and Mr. Benjamin have generously yielded the authorship of the species to me.

Atrytone (Euphyes) dukesi n. sp.

♂. Wings more broadly rounded than in normal *Euphyes*, the secondaries conspicuously different, approaching the ♀ wing form of the genus.

Upper surface: Primaries lustrous brownish black with a black stigma of typical form which appears rather short through lack of contrast. Stigma followed by scattered fulvous scales which form vague patches between the veins. Base of primaries with some scales of the same color in the better specimens. Basal two-thirds of secondaries behind anterior margin of cell with fulvous hairs and scales, forming a rather definite patch between M_1 and M_2 beyond cell, and a triangular spot in the angle of M_2 and Cu_1, but otherwise diffuse. Fringe concolorous, slightly paler toward anal angle of secondaries. Body concolorous.

Under surface: primaries brownish black with the costa before SC yellow-fulvous, and a heavy powdering of scales of this color extending on through the costal area, over the apex, and back on the outer margin to Cu_2. Secondaries completely overlaid with this color, veins pale. Through the cell, fading toward the outer margin, is a pale ray,

and between Cu_2 and the first anal there is a similar pale stripe which is less definite. These marks are much the same as the pale stripes of *dion*. The entire ventral surface of the body is almost white, unlike the related species. The abdomen bears a dark brown midventral line. Expanse 35 to 38 mm.

Described from four males, all taken in Mobile County, Alabama, in 1922. *Holotype:* Aug. 6, in coll. Barnes. *Paratype:* Aug. 27, returned to Mr. Dukes. The two remaining *paratypes*, taken Aug. 27 and 29, are in the collection of the author.

In examining the genitalia of the holotype *in situ*, I was inclined to agree with Mr. Benjamin that the valve differed in shape from that of *dion*. Subsequently I dissected out and mounted the genitalia of one of the paratypes, which prove to be indistinguishable from those of a specimen of *dion* from Wisconsin. The species is, however, very distinct from any other in the North American fauna. Its salient features are the extremely dark color and the abnormal wing shape. Mr. Benjamin compared the holotype with material in the National Museum, and has given me Mr. Schaus' note that it is nearest to *Hesperia aurina* Plötz from Jamaica, although undoubtedly distinct. It gives me great pleasure to name this species for Mr. Dukes, in acknowledgment of his unselfish efforts to advance our knowledge of the Lepidoptera of Alabama.

Atrytone (Euphyes) dion race **alabamae** new.

♂. Similar to *dion*, but with the yellow-fulvous of the upper surface reduced to a single subapical spot between R_5 and M_1, a streak in the lower angle of the cell, and a small dot beyond this which is the first of a series forming a greatly reduced band along the outer edge of the stigma. This leaves a fuscous terminal area occupying about two-fifths of the length of the wing. Secondaries also with the fulvous reduced, though less conspicuously.

Under surface darker than in *dion*. The macular band of the primaries is limited to three small spots beyond the stigma, and the two pale rays on the secondaries are less in contrast with the ground color than in *dion*.

Holotype: 1 ♂, Mobile County, Alabama, June 25, 1922, W. C. Dukes, in the collection of the author.

The records of distribution of *dion* available to me show New Jersey as the southernmost reported capture, and all specimens which I have seen are so much paler and brighter than *alabamae* that they might easily be taken for a different species. The primaries of the race are rather like those of *bimacula*.

Mr. Dukes has also sent me one male of *Poanes viator* taken at Chikasaw, Alabama, Oct. 1, 1922. This appears to be a new southern record also.

Notes on Pennsylvania Diptera.

By A. B. CHAMPLAIN and J. N. KNULL, Bureau of Plant Industry, Harrisburg, Pa.*

Among the Dipterous material in the state collection of the Pennsylvania Bureau of Plant Industry are certain species or specimens that bring to mind some new or interesting facts of a biological nature, worthy of record.

The following notes are from captures and observations made by the authors, who have given special attention to bringing together and collecting biological data on local insects, and by other members of the Bureau, who have been credited with their notes in each instance.

The authors are indebted to Mr. Chas. W. Johnson, of the Boston Society of Natural History, for identifications and suggestions.

TIPULIDAE.—*Tanyptera* [*Xiphura*] *frontalis* O. S., *T. fumipennis* O. S., *T. topazina* O. S.

Adults of the three species were collected in flight, from May 25th until June 10th, in a swampy bottom, northern exposure, at Inglenook, Pennsylvania. Larvae of *Tanyptera* may be found in this swamp throughout the year in galleries in watersoaked or moist brashy stumps, logs, and limbs of trees on the ground.

MYCETOPHILIDAE.—*Diomomus subcaeruleus* Coq. An adult of this rare fly was captured flying at Inglenook, Pa., June 17.

TABANIDAE.—*Haematopota rara* Johnson. Represented by two specimens, both collected by Prof. J. G. Sanders at Montebello, Pa., June 24, 1917, and at Hummelstown, Pa., June 10, 1920, respectively, while sweeping sedges along the edge of small streams.

LEPTIDAE.—*Xylophagus abdominalis* Loew.

Adults were reared from larvae collected beneath the bark of dead pine, where they were observed feeding on the larvae of the beetle, *Rhagium lineatum* Oliv.

CYRTIDAE.—*Oncodes dispar* Macq.

While chopping into an old decaying log in Wildwood Park, Harrisburg, Pa., August 20th, some years ago, adults of this Cyrtid were found dead, but in good condition, in the cells of a

* Publication suggested by Prof. J. G. Sanders, Director of the Pennsylvania Bureau of Plant Industry.

spider-killing wasp. The wasp apparently caught the spiders that were infested by larvae of *Oncodes,* stored them in cells with her eggs, sealed the gallery and departed. The *Oncodes* larvae consumed the spiders and possibly the wasp larvae, then transformed and were unable to get out. Remains of the spiders were present in the cells.

Opsebius pterodontinus O. S., Manada Gap, Dauphin Co., Pa., July 4, 1920,—a living adult found floating in a small spring at the foot of the mountain.

MYDAIDAE.—*Mydas tibialis* Wied. A single example of this species, labeled Perdix, Pa., July 19, 1914, is in the Bureau collection. It was collected by Mr. J. E. MacNeal, who presented it to the late V. A. E. Daecke.

ASILIDAE.—*Dasyllis grossa* Fabr.

An adult of this large fly was observed capturing a specimen of *Tibicen sayi* S. & G. in midair, at Montebello, Pa. The cicada was probably twenty feet from the ground when it suddenly dropped to earth with the *Dasyllis.* In this case the prey was too bulky to carry off, as is the usual practice.

Nusa fulvicauda Say, Hummelstown, Pa., June 1.

Larvae and pupae of this species found in the pupal cells of *Chrysobothris femorata* Oliv. in *Quercus* sp. were caged and reared.

EMPIDAE.—*Rhamphomyia* sp.

"On April 12th, 1921, I noted the mating of flies of this genus. My attention was attracted to what seemed to be small clusters of dead flies on the roots of some uprooted peach trees in Miller's orchard at Marion, Pa. Each cluster proved to be a male and female in copulation. The male hung suspended by the hind legs from a support and held the female with his middle and front legs. The female in turn held a smaller fly with her legs and appeared to be feeding upon it. In collecting three pairs of flies, I obtained three different species of flies in the grasp of the females. Two of these flies were dead and one alive."—J. R. STEAR.

PHORIDAE.—*Aphiochaeta*? sp.

Violet seeds collected for the seed herbarium by Mr. W. A. McCubbin were found to be infested by specimens of a small

maggot that had eaten out the interior of the seed. The seeds had been collected at Edenville, Pa., May 24th, and were not examined until August 28, 1922, when the damage was noticed. At this time there were a number of dead, dried larvae in the vials (probably on account of lack of moisture) and about six pupae, which were also dead. These pupae, however, were identical with the drawing and description of *Aphiochaeta rufipes* Meig., a species that was recorded as infesting onion seed,[1] by Mr. B. H. Walden in Connecticut.

It is likely that the seed became infested when on the drying trays.

SYRPHIDAE.—*Microdon craigheadi* Walton.

This beautiful little green species occurs at Rockville, Pa., July 23 to August 4th. It may easily be mistaken for a "Cuckoo wasp," *Chrysis* sp., as it has the habit of flying up and down in a nervous manner, along the trunks of dead trees (*Pinus*) like the *Chrysididae*. It seemed to be especially interested in the dead snags infested by ants and probably breeds in these stumps. It is rare and difficult to catch.

Meropioidus villosus Bigot. One specimen of this species captured on the mountain top at Rockville, Pa., 1200 feet elevation, March 30, on open catkin of Alder, (*Alnus* sp.)

Volucella vesiculosa Fabr. The larvae may be found breeding in wounds and pockets in oak trees, the adults feed on running and fermenting sap on oak trees. The records in the collection are as follows:—Charter Oak, Pa., July 11, two males, Knull. Cresco, Pa., June 10, one male, H. B. Kirk. Harrisburg, Pa., July 20, at fermenting sap, four females, H. B. Kirk; Manumuskin, N. J., June 23, male, V. A. E. Daecke; Da Costa, N. J., June 4, Daecke.

Criorhina nigriventris Walton.

The type of this species[2], a female, was taken in Wildwood Park, Harrisburg, Pa., March 24, resting on a tree trunk, in a swampy region, near the foot of the first mountain and no additional specimens were taken for several years. The apparent center of distribution was finally located. On the extreme top of the first mountain (Rockville, Pa.), three miles from where

[1] Rep. Conn. Agriculture Experiment Station 1909-10, 693.

[2] W. R. Walton, Ent. News, XXII, p. 318, 1911.

the type was taken, there is a rocky ridge where the boulders are piled by nature in picturesque confusion; cropping out here and there in addition to other vegetation grows a wild gooseberry, *Ribes rotundifolium?* From April 20th until May 15th, or thereabouts, the adults of *Criorhina nigriventris* are to be found, flying about in the air, resting on the boulders in the sunny spots and visiting the gooseberry blossoms, which appear to furnish their favorite food.

In company with *C. nigriventris,* which is not rare, but exceedingly wary and swift in flight, and difficult to capture, we find *Criorhina verbosa* Walk. very common, and also feeding in the gooseberry flowers.

Our captures of *C. nigriventris* are not very numerous; a visit to "Criorhina Hump," as we now call it, at the proper time each year, will furnish sport, exercise, and the possibility of a specimen or two of this interesting fly.

TACHINIDAE.—*Schizotachina vitinervis* Thomp., Hummelstown, Pa., 1922.

Reared from Yellow Pine needles infested with needle-mining Lepidopterous larvae, probably *Paralechia pinifoliella* Cham.

Pachyophthalmus signatus Meig., Linglestown, Pa. Reared from cocoon of *Trypoxylon albitarse* Fab.

Euthera tentatrix Loew, Charter Oak, June 20; Chambersburg, June; Cresco, July; Hunters Run, Pa., May 30.

DEXIIDAE.—*Eutheresia canescens* Walk. This species is a parasite of *Rhagium lineatum* Oliv. Adults were reared in June from *Rhagium* larvae, collected beneath white pine bark at Charter Oak, Pa.

SAPROMYZIDAE.—*Lonchaea polita* Say.

"Wildwood Park, Harrisburg, Pa., February 12, in swamp. Quite a number of larvae found scattered between the thin, moist, frosty, ribbon-like inner layers of bark on a dead black locust log.

"Some of the larvae, separated for observation, are quite active and are capable of climbing up the vertical side of a vial. They also 'skip' vigorously. They have a pair of small, black, curved hooks which they 'thrust from the mouth' or hook to the anal end when 'skipping.'

"The larvae went into the sand in the cages to pupate, some

at the bottom of the cage, others scattered through the sand, but all beneath the surface.

"There was a species of *Trypetid* among the flies that emerged but the majority were *Sapromyzidae*."—A. F. SATTERTHWAIT.

Harrisburg, Pa., May 14, Larvae and pupae from beneath loose bark of dead white pine stub. Adults emerged May 19. —H. B. KIRK.

ORTALIDAE.—*Pyrgota chagnoni* Johnson. One specimen collected at Wilkes-Barre, Pa., May 27.

TRYPETIDAE.—*Rhagoletis pomonella* Walsh.

"From infested apples caged near New Bloomfield, Perry County, Pennsylvania, the first fly emerged on June 27, and the first fly of the second brood emerged on August 31. The last fly of the second brood emerged on October 12. Flies were observed in the orchard from June 27 until frost."—T. L. GUYTON and J. N. KNULL.

MICROPEZIDAE.—*Taeniaptera* [*Calobata*] *antennipes* Say. Eberleys Mills, Pa., July 11 to 14, on trees in a small, triangular bottom along the Yellow Breeches Creek.—Kirk and Champlain.

HIPPOBOSCIDAE.—*Ornithoica confluenta* (Say), Wellsboro, Pa., Nov. 21, from Barred Owl.

Change of Address.

Mr. Hermann Hornig has removed his residence to 1233 North 44th St., Philadelphia, Pa.

A Bird Catching a Butterfly (Lepid.: Pieridae).

On April 29, 1923, I went to Almonessen, New Jersey, to have a collecting trip for *Anthocharis* and *Thecla*.

Insects were very few: 3 *Anthocharis genutia*, 2 *Pieris rapae*, 2 *Thecla hypophleas*, 1 *Th. comyntas*, 2 *Th. damon* and a few Crane-flies. I caught 2 genutias. The third one, a female, was flying at the edge of the woods near briars. I watched for it to come into the open. Unexpectedly a bird swooped down, caught the genutia and settled on a branch overhead about 12 feet away from the place I was standing. The bird, a red eyed Vireo, shifted the genutia lengthwise in his beak and swallowed it entirely.

You may know how surprised I was, as I never in all the past years saw a bird catching a butterfly. (I saw them picking moths). I thought the bird would drop the butterfly's wings so I could examine and take them as proof, but there was nothing left.—H. HORNIG, City Entomologist, Room 758, City Hall, Philadelphia, Pa.

ENTOMOLOGICAL NEWS

PHILADELPHIA, PA., JULY, 1923.

The Zoological Record.

In the NEWS for March, 1922, page 91, under the caption "Save the Zoological Record!" we reprinted from *Science* an appeal issued by Mr. W. L. Sclater, Editor of the Record, for the Zoological Society of London, urging fuller support for the *Record* from working zoologists everywhere. In our editorial for April, 1922, pages 119-120, we strongly seconded this appeal.

Science for May 18, 1923, page 577, reprints a letter by Mr. P. Chalmers Mitchell to the London *Times* in which the following occurs:

> May I say that the council of the Zoological Society will much regret if the *Zoological Record*, which it has supported with increasing financial difficulty for many years, has to be dropped? But the annual loss on the issues is over £1,100, and is likely to increase as the output of zoological research increases. . . . Last year the council, in its annual report and in circulars addressed to zoologists and zoological institutions throughout the world, explained the financial position, and stated that unless those to whom the *Record* was "invaluable" showed their appreciation of it by subscribing for a sufficient number of copies, the society could no longer undertake the publication. The response was unsatisfactory, and the council has accordingly taken the inevitable step of making it known that the *Record* will be discontinued unless substantial help is forthcoming. But it is so anxious to give those to whom the *Record* is necessary full opportunity of coming to its support, that it has undertaken to proceed with the compilation so that no time may be lost. . . . . Because of the drain of the *Record* on our resources we have already been compelled to suspend the publication of our "Transactions," and to postpone other scientific work of immediate interest to us; we are certainly not going to suspend the issue of our "Scientific Proceedings," which have appeared continuously since 1829, in order to carry out bibliographical work for other institutions. On the other hand, we are ready to continue the *Record*, and to regard a loss of £500 a year as part of our contribution to the common good of zoological science, if other institutions guarantee us against further loss.

We do not know to what extent entomologists have responded to the Zoological Society's appeal of 1922. In the

event that this editorial may meet the eyes of some who can help with the *Record,* but have not done so, we put the question to them: Do you realize what the discontinuance of the *Record* will mean to you? Do you realize that unless the Concilium Bibliographicum speedily brings up its bibliographical data (now back in 1917) to the present, supposing also that the *Concilium* is satisfactory to you, you will be compelled to gather your own zoological bibliography at a great expense of time and with probably much less completeness than the *Record* has afforded? Are you willing to see this deplorable state of affairs come about? If not, will you not exert yourself immediately to obtain additional subscriptions for the *Record* and forward them to the Zoological Society of London? The subscription price for the entire volume per annum is £2 10s (single volumes £3), but separate divisions of the volumes may be subscribed for, *e. g.,* the Insecta at 15 shillings, the Trilobita, Arachnida and Myriopoda, at 4 shillings for the three groups combined.

We urge this upon zoologists and entomologists even if the institutions with which they are connected are already subscribers to the *Record.* The writer is not asking others to do what he has not done himself a year ago in response to the appeal then issued, even though a large part of each volume will be of no use to him. Better still, let all institutions who can offer to guarantee to the support of the *Record* a certain annual sum, say fifty or one hundred dollars each. No great number of guarantors throughout the world would be required to cover all expenses.*

We may again voice the hope expressed in our editorial of April, 1922, that co-operation between the *Zoological Record* and the *Concilium Bibliographicum* may be arranged, but, pending that consummation, the *Record* should be kept going and, as usual, the necessity is financial support.

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* Since the above was written the Council and the Library Committee of the Academy of Natural Sciences of Philadelphia have voted to offer to the Zoological Society of London a guarantee of $100. toward the expenses of the volume of the *Record* issued during the year ending July 1, 1924, and to address other institutions, urging them to take similar action.

Notes and News.

ENTOMOLOGICAL GLEANINGS FROM ALL QUARTERS OF THE GLOBE

Correction of Several Typographical Errors (Phalaenidae = Noctuidae, Lepid).

Attention is called to a paper by Professor Grote, "Introduction to a Study of the North American Noctuidæ," published 1883, Proc. Am. Phil. Soc., XXI. Page 159 calls attention to a number of typographical errors most of which have been perpetuated to date. These names are quoted herein; each name being followed by the name of the genus now commonly employed and the Barnes and McDunnough 1917 Check List number, in order to facilitate correction. The name before the *as* is intended by Grote as the correction for the name which follows: "Phiprosopus Callitrichoides *as* Phyprosopus Callitrichoides," *Phiprosopus*, No. 3436.

"Phisia Viridisignata *as* Plusia Viridisigma," *Autographa*, No. 3234 syn.

"Perigea Sole *as* Perigea Scole," *Perigea*, No. 2322a.

"Hadena Perpensa *as* Hadena Perpenoa," *Trachea*, No. 2289.

"Oncocnemis Gracillima *as* Oncocnemis Gracillinea," *Oxycnemis*, No. 2541.

"Heliochilus Paradoxus *as* Heliocheilus Paradoxus," *Heliothis*, No. 1087.

Strangely, in these corrections there are three more typographical errors; *Phisia* for *Plusia*, *Sole* and *Scole* for *Iole* and *Icole*. The correct spelling of the name of the *Perigea* is shown on page 146 of the same paper, "Perigea Iole *m.*," and the *Perigea icole* of the lists should be amended to read *Perigea iole*.—WM. BARNES and F. H. BENJAMIN, Decatur, Illinois.

On Megathymus stephensi Skinner (Lepid., Hesperiidae).

Megathymus stephensi Skinner

1905, Wright, Butt. W. Coast, p. 255, pl. XXXII, f. 483, as *neumoegeni* in err., *Megathymus*.

1912, Skinner, Ent. News, XXIII, 126, *neumoegeni* ssp., *Megathymus*.

1912, B. & McD., Contr. Nat. Hist. Lep. N. A., I, (5), 44, *neumoegeni* race, *Megathymus*.

1913, B. & McD., Contr. Nat. Hist. Lep. N. A., II. (1), 4, pl. I, f. 7, *neumoegeni* ——, *Megathymus*.

1917, Skinner, Ent. News. XXVIII, 232, an sp. dist., *Megathymus*.

1921, Lindsey, U. of Ia. Studies, IX, (4),=Hesp. Amer., p. 109, *neumoegeni* race, *Megathymus*.

Having examined the genitalia of the various species of Megathymus of the *neumoegeni* group, the authors are quite willing to agree with Dr. Skinner's latest version of the status of *stephensi*. It is apparently a distinct species; the valves of the male genitalia differing considerably in shape from other members of the *neumoegeni* group.

WM. BARNES AND F. H. BENJAMIN, Decatur, Illinois.

External Parasites of the Prairie Mole Scalops aquaticus (Linn.) (Siphonap., Anopl.).

What appears to be a new host record was the finding of a flea, *Ctenophthalmus genalis* Baker, (fide Ferris) by the writer on moles caught in the vicinity of Ames, Iowa, during November, 1922, and April, 1923. This flea was taken on several different moles but it never occurred in large numbers. The type specimens of this parasite, which furnish the only published record of its capture, were taken in Michigan without identification of host.

A louse, *Euhaematopinus abnormis* Osborn, was also found and was very abundant. It was originally recorded from Ames, and seems to be a species that is peculiar to this particular species of mole. As a result of very heavy infestation on one side of an animal the fur was very short, giving it the effect of a rather close clipping; the fur and skin on the uninfested side of this mole were normal.—E. W. DUNNAM, Dept. Zoology and Entomology, Iowa State College, Ames, Iowa.

Entomological Literature

COMPILED BY E. T. CRESSON, JR., AND J. A. G. REHN.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species, will be recorded.

The numbers in **Heavy-Faced Type** refer to the journals, as numbered in the following list, in which the papers are published.

All continued papers, with few exceptions, are recorded only at their first installments.

The records of papers containing new genera or species occurring north of Mexico are grouped at the end of their respective Orders.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B

The titles occurring in the Entomological News are not listed.

4—Canadian Entomologist, Guelph, Canada. **9**—The Entomologist, London. **10**—Proceedings of the Entomological Society of Washington, D. C. **12**—Journal of Economic Entomology, Concord, N. H. **16**—The Lepidopterist, Salem, Mass. **19**—Bulletin of the Brooklyn Entomological Society. **20**—Bulletin de la Societe Entomologique de France, Paris. **22**—Bulletin of Entomological Re-

search, London. **45**—Zeitschrift fur wissenschaftliche Insektenbiologie, Berlin. **50**—Proceedings of the United States National Museum. **51**—Archiv fur Mikroskopische Anatomie, Bonn. **52**—Zoologischer Anzeiger, Leipzig. **54**—Proceedings of the Biological Society of Washington, D. C. **57**—Biologisches Zentralblatt, Leipzig. **64**—Parasitology, London. **67**—Le Naturaliste Canadien, Quebec. **68**—Science, Garrison-on-the-Hudson, N. Y. **69**—Comptes Rendus, des Seances de l'Academie des Sciences, Paris. **76**—Nature, London. **90**—The American Naturalist, Lancaster, Pa. **91**—The Scientific Monthly, Lancaster, Pa. **94**—The American Journal of Science, New Haven, Conn. **98**—Annals of Tropical Medicine and Parasitology, Liverpool. **99**—Bulletin du Museum National d'Histoire Naturelle, Paris. **115**—Societas Entomologica, Stuttgart. **124**—Bulletin de la Societe entomologique d'Egypte, Cairo. **125**—Verhandlungen der zoologisch-botanischen Gesellschaft in Wien. **128**—Zeitschrift fur Induktive Abstammungs und Vererbungslehre, Leipzig. **138**—American Museum Novitates, New York. **145**—Annali del Museo Civico di Storia Naturale Giacomo Doria, Genova. **146**—"Konowia," Wien.

GENERAL. Ball, E. D.—Courses for the post-graduate student of entomology. **12,** xvi, 182-5. **Banks, C. S.**—A method of illustrating insect wings. (Phil. Jour. Sci., xxii, 407-12.) **Bather, W. T.**—Another reminiscence of early days. **19,** xviii, 56-7. **Bibliographia** zoologica. Vol. xxxi. **Brues, C. T.**—Is poliomyelitis an insect-borne disease? **91,** xvi, 471-87. **Buddenbrock, W. V.**—Einige bemerkungen ueber den schwirrflug der insecten mit besonderer berucksichtigung der halteren der zweiflugler. (Verh. Heidelb. Natur. Med. Ver., n. f., xiii, 497-15.) **Chapman, T. A.**—What is a species? **21,** xxxv, 62-4. **Chappellier, A.**—Regime alimentaire des corbeaux freux et "moyens de defense" des insectes. **20,** 1923, 73-5. **Cockerell, T. D. A.**—The data of entomology. **4,** lv, 79-80. Insects and other arthropods of the Green River formation. (U. S. Geol. Surv., Bull. 729, 23-30.) **Craighead, F. C.**—The host selection principle as advanced by Walsh. **4,** lv, 76-9. **Dicksee, Uvarov & Burr.**—The distress of Russian entomologists. **9,** lvi, 99. **21,** xxxv, 65-6. **Escherich, K.**—Zeitschrift fur angewandte entomologie. viii, Heft 2. **Felt, E. P.**—Origin and evolution of the insects. **91,** xvi, 588-93. **Handlirsch, A.**—Revision der Palaozoischen insekten. (Denkschr. Math.-Naturw. Klasse, Acad. Wissens. Wien. cxvi, 511-92.) **Hargitt, G. T.**—Invertebrate animals and civilization. **91,** xvi, 608-22. **Hoffman, A.**—Marktbericht. **124,** iii, 45-6. **Hunt, H. F.**—Preservation of specimens: mould. **9,** lvi, 115-6. **Kellogg, V.**—Extra-entomological studies for the young entomologist. **12,** xvi, 185-97. **Locket, G. H.**—Tactile vision of insects and arachnida. **76,** cxi, 570-71. **Mitchell, P. C.**—The "Zoological Record." **68,** lvii, 577. **Moore, W.**—The need of chemistry for the student of entomology. **12,** xvi, 172-6. **O'Kane,**

W. C.—The entomologist and the public. **12,** xvi, 176-82. **Pierce, W. D.**—The laws of nature as affecting insect abundance. (Lectures in Ap. Ent., Ser. 1, pt. 2, No. 0.)

ANATOMY, PHYSIOLOGY, ETC. Breitenbecher, J. K.—A red-spotted sex-limited mutation in Bruchus. **90,** lvii, 59-65. **Cannon, H. G.**—Spermatogensis of the Lepidoptera. **76,** cxi, 670-71. **Clausen, R. E.**—Inheritance in Drosophila hydei. **90,** lvii, 52-8. **Gatenby, J. B.**—Spermatogenesis of the Lepidoptera. **76,** cxi, 568. **Loewenthal, H.**—Cytologische untersuchungen an normalen und experimentell beeinflussten Dipteren (Calliphora erythrocephala). (Archiv f. Zellforschung, Leipzig, xvii, 86-101.) **Mann, M. C.**—The occurrence and hereditary behavior of two new dominant mutations in an inbred strain of Drosophila melanogaster. Genetics, viii, 27-36.)

ARACHNIDA AND MYRIOPODA. Schrader, F.—Haploidie bei einer spinnmilbe. **51,** xcvii, 610-21.

THE SMALLER ORDERS OF INSECTA. Barber, B. A.—Notes on the life-history and habits of Mallophaga. (Pap., Mich. Ac. Sc. A. & Let., i, 391-5.) **Enderlein, G.**—Beitrage zur kenntnis der Copcognathen VII. **146,** ii, 32.3. **Esben-Petersen, P.**—Ueber das genus Dendroleon. **146,** ii, 86-92. **Philiptschenko, J.**—Studien ueber variabilitat. 3. Ueber die variabilitat der Collembolen. **128,** xxx, 145-62. **Smith, R. C.**—The biology of the Chrysopidae. (Cornell Agr. Expt. Sta., Mem. 58.) **Snyder, T. E.**—A new Glyptotermes from Porto Rico. **10,** xxv, 89-94. **Suminski, S.**—Sur la structure et la developpement des organes copulateurs males chez l'Anax imperator. [Polish]. (Trav. Soc. Sci. Varsovie, Cl. Sci., 1917, No. 22.)

Cockerell, T. D. A.—Fossil insects from the Eocene of Texas. **94,** v, 397-400. **Williamson, E. B.**—A new sp. of Williamsonia. (Odonata.) **4,** lv, 96-8.

ORTHOPTERA. Caudell, A. N.—Correction in Zoraptera. **10,** xxv, 104. **Chopard, L.**—Description d'un Gryllide cavernicole de la Jamaique. **20,** 1923, 84-6. **Schaxel & Adensamer.**—Ueber experimentelle verhinderung der regeneration bei Phasmiden. **52,** lvi, 128-33. **Vignon, P.**—Sur le mimetisme des sauterelles Pterochrozees. **69,** 1923, 1348-50. **Vignon, P.**—Notes sur les Pterochrozae du Mus. Nat., Paris. Sept especes nouvelles dans le genre Pterochroza. **99,** 1922, 523-29.

HEMIPTERA. Barber, H. G.—A preliminary report on the Hemiptera-Heteroptera of Porto Rico collected by the American Museum of Nat. Hist. **138,** No. 75. **Chapais, J. C.**—Comment se debarrasser des mouches blanches de nos serres chaudes. **67,** xlix, 219-22. **Ferris & Hyatt**—The life history of Euphyllura arbuti. (Chermidae.) **4,** lv, 88-92. **Hartzell, A.**—Distribution of the Euro-

pean elm scale. (Proc. Iowa Acad. Sc., xxviii, 201-5.) **McAtee & Malloch**—Further notes on names of Emesinae and other Rhynchota. **54,** xxxvi, 161-4. **Parshley, H. M.**—The distribution and forms of Lygaeus kalmii, with remarks on insect zoogeography. (Lygaeidae.) **4,** lv, 81-4. **Schmidt, E.**—Neue Fulgoriden. **115,** xxxviii, 17-18. **Schrader, F.**—The sex ratio and oogenesis of Pseudococcus citri. **128,** xxx, 163-82. **Stear, J. R.**—Orthocephalus mutabilis. (Miridae.) **19,** xviii, 62. **Takahashi, R.**—Observations on the Ochteridae. **19,** xviii, 67-8.

LEPIDOPTERA. Blackmore, E. H.—Rare and uncommon lepidoptera taken in Br. Columbia during 1922. (Rept. Br. Col. Prov. Mus. N. H., 1922, O, 23-35.) **Clark, B. P.**—Thirty-three new Sphingidae. (Proc. N. Engl. Zool. Club, viii, 47-77.) **Cleare, L. D.**—Notes on the small moth-borers of sugar-cane in Br. Guiana. **22,** xiii, 457-68. **Meyrick, E.**—Exotic Microlepidoptera. ii, 609-40. **Pruffer, J.**—Forschungen uber die abhangigkeit der schmetterlingsflugel von der gestalt der schuppen. (Comp. Rendus Sean. Soc. Sci. Varsovie, ix, 1916, 1139-54.) **Pruffer, J.**—Neue formen von schmetterlingen Perus. (Disc. Biol. Arch. Soc. Sci. Versav., i, Fasc. 2.) **Seitz, A.**—The macrolepidoptera of the World. Fauna Amer. pts. 120-123. Arctiinae, Phaegopterinae.

Barnes & Benjamin—Notes and new species (Geometridae.) **16,** iv, 9-12. **Blackmore, E. H.**—Two new races of the genus Plebeius from Br. Columbia. **4,** lv, 98-100. **Cassino & Swett**—New Geometrids. **16,** iv, 13-16. **Heinrich, C.**—Revision of the N. American moths of the subfamily Eucosminae of the family Olethreutidae. (U. S. Nat. Mus., Bull. 123.)

DIPTERA. Buddenbrock, W. V.—(See under General Subjects.)

Brunetti, E.—Two n. species of Tabanidae from Cuba. **22,** xiii, 401-2. **Christophers, S. R.**—An Anopheles of the Myzorhynchus group (Anopheles amazonicus) from S. America. **98,** xvii, 71-8. **Cuenot & Mercier**—Les muscles du vol chez mutants alares des Drosophiles. **69,** 1923, 1112-12. **Edwards, F. W.**—New and old observations on Ceratopogonine midges attacking other insects. **98,** xvii, 19-29. **Evans, A. M.**—Notes on Culicidae in Venezuela, with descriptions of n. sps. **98,** xvii, 101-11. **Ferris, G. F.**—Observations on the larvae of some Diptera Pupipara, with description of a new sp. of Hippoboscidae. **64,** xv, 54.8. **Greene, C. T.**—A contribution to the biology of N. A. diptera. **10,** xxv, 82-9. **McAtee, W. L.**—District of Columbia diptera: Bibionidae. **10,** xxv, 81-2. **Marchand, W.**—The larval stages of Limnophora discreta. (Anthomyiidae.) **19,** xviii, 58-62. **Shannon, R. C.**—Rearing dipterous larvae on nutrient agar. **10,** xxv, 103-4. **Smirnov, E.**—Ein beitrag zur kenntnis der gattung Helophilus. **52,** lvi, 81-87.

Aldrich, J. M.—A new parasitic fly bred from the bean-weevil. **10,** xxv, 95-6. **Cole, F. R.**—A revision of the North American two-winged flies of the family Therevidae. **50,** lxii, Art. 4. **Curran, C. H.**—Revision of the asilid genus Cyrtopogon and allied genera. **4,** lv, 92-5. **Sturtevant, A. H.**—New species and notes on synonymy and distribution of Muscidae Acalyptratae. **138,** No. 76.

COLEOPTERA. Andrews, A. W.—The coleoptera of the Shiras expedition to Whitefish Point, Chippewa Co., Michigan. (Pap., Mich. Ac. Sc. A. & Let., i, 293-390.) **Benderitter, E.**—Quelques Rutelides exotiques nouveaux. **20,** 1923, 91-4. **Bernhauer, M.**—Neue Staphyliniden aus Sudamerika. **125,** lxxxi, 1-23. **Blanchard, F. N.**—The tiger beetles of Cheboygan and Emmet Co., Michigan. (Pap., Mich. Ac. Sc. A. & Let., i, 396-417.) **Pic. M.**—Melanges exotico-entomologiques. Fasc. 38. **Pic, M.**—Scaphidiides nouveaux de diverses origines. **145,** xlix, 93-7. **Szwajsowna, P.**—Le metabolisme physiologique chez les larves du Tenebrio molitor. Polish. (Comp. Rendus Sean. Soc. Sci. Varsovie, ix, 1916, 405-27.) **Woods, W. C.**—Altica or Haltica? **19,** xviii, 63-7.

Van Dyke, E. C.—New species of C. from California. **19,** xviii, 37-53.

HYMENOPTERA. Brocher, F.—La tete du frelon (Vespa crabro). (Bul. Inst. Nat. Genevois, xlv, 223-56.) **Forel, A.**—Le monde social des fourmis Tome. 4, Alliances et guerres, parabiose, lestobiose, esclavagisme, 170 pp. **Friese, H.**—Ein instruktives bienennest aus den hochanden Chiles. **45,** xviii, 56-7. **Friese, H.**—Ueber einige neue Euglossa-arten. **146,** ii, 24-8. **Kohl, F. F.**—Die Hymenopteren-gattung Belomicrus. **146,** ii, 98-122 (cont.) **Masi, L.**—Spolia Hymenopterologica. **145,** xlix, 235-41. **Rohwer, S. A.**—National collection of Cynipidae. **10,** xxv, 106. **Santschi, F.**—Myrmicines, dolichoderines et autres formicides neotropiques. (Bul. Soc. Vaud. Sci. Nat., Lausanne, liv, 345-78.) **Stockhert, E.**—Ueber entwicklung und lebensweise der bienengattung Halictus, und ihrer schmarotzer. **146,** ii, 48-64. **Thompson, W. R.**—Sur le determinisme de l'apterisme chez un Ichneumonide parasite. **20,** 1923, 40-2. **Wasmann, E.**—Alte berichte ueber die Atta-nester Sudamerikas, mit einem statischen vergleich der anpassungen an Atta und an Eciton. **57,** xliii, 106-15. **Waterson, J.**—On an internal parasite of a thrips from Trinidad. **22,** xiii, 453-55.

Cockerell, T. D. A.—Two nocturnal bees and a minute Perdita. **138,** No. 66. **Cockerell, T. D. A.**—(See under Smaller Orders.) **McDunnough, J.**—Notes on Pterophoridae with descriptions of n. sps. **4,** lv, 85-7. **MacGillivray, A. D.**—New species of Tenthredinidae from the East and Middle-west. **19,** xviii, 53-6. **Rohwer, S. A.**—New Aculeate Hymenoptera from the U. S. **10,** xxv, 96-103.

Doings of Societies.

The American Entomological Society.

Meeting of April 26, 1923, in the hall of the Academy of Natural Sciences of Philadelphia, Dr. Henry Skinner, President, in the Chair; seven members present.

Mr. Cresson of the Property Committee reported the receipt of insects for the collection from the following: 7 Diptera from T. D. A. Cockerell; 1 Diptera, 4 Neuroptera and 2 Orthoptera from M. Hebard; 1 Orthopter from F. M. Jones; 268 insects, 210 galls (Paratypes) from A. C. Kinsey; 22 Mayflies from G. S. Dodds; 4 Cicadidae from W. T. Davis; photographs of H. Strecker and C. T. Ramsden from Henry Skinner. The following publications: Le Monde Social des Fourmis by A. Forel, 3 parts; The Structure and Life History of the Cockroach by Miall & Denny; Les Larves et Nymphes Aquatiques des Insectes d'Europe by E. Rousseau; Pterophoridae of California and Oregon by Lord Walsingham.

The President read a communication from the Council of the Academy of Natural Sciences of Philadelphia requesting the Society to appoint a committee to meet with other committees representing a number of other scientific societies to consider suitable methods for commemorating the 100th anniversary of the birth of Dr. Joseph Leidy. A motion was made and carried that the President appoint a committee of three of which he should be one for this purpose. The following were appointed: Henry Skinner, E. T. Cresson, Jr. and R. C. Williams, Jr.

Communications were read from Mr. C. M. Van Duzee and Mr. Theodore H. Frison in which they refer to types and paratypes of insects they are sending to the Society for its museum as the best repository for such material.

A motion was made and carried that a committee be appointed to make arrangements for a field day. Dr. Skinner appointed Messrs. Williams, Rehn and Cresson on this committee.

Mr. Robert J. Titherington was elected a member of the society.

Mr. Cresson exhibited several boxes of Paratypic Cynipidae (69 species, 268 insects and 210 galls) from the United States received from Mr. A. C. Kinsey.

Mr. Rehn gave an interesting account illustrated by lantern slides covering his recent trip with Mr. Hebard through the West and Southwest, showing the character of the collecting grounds, the topography and the vegetation of the districts covered.

R. C. Williams, Jr., Recording Secretary.

Entomological Union of Stettin.

The Entomologischer Verein zu Stettin is sorely in need of funds to continue the publication of its well-known *Zeitung*. For that purpose it desires to sell single volumes or complete sets of Vols. 2-83. Those interested should address Prof. L. Krüger, Stettin, Museum, Hakenterrasse, Germany.

EXCHANGES

This column is intended only for wants and exchanges, not for advertisements of goods for sale. Notices not exceeding three lines free to subscribers.

These notices are continued as long as our limited space will allow; the new ones are added at the end of the column, and only when necessary those at the top (being longest in) are discontinued.

For Exchange—A large number of live cocoons of Callosamia promethea, C. cynthia and P. cecropia for other pupae or Lepidoptera. D. C. Heim, Sunbury, Pa.

Wanted to Exchange—N. A. Coleoptera for same not in my collection. Carl Selinger, 4419 Dover St., Chicago, Ill.

Wanted for Cash or Exchange—Catocala eggs, also brilliant colored butterflies and moths for trays. Mrs. Robert Milde, Lewiston, Minn.

Syrphidae from all parts of North America wanted. Monographing the family.—C. H. Curran, Department of Entomology, University of Kansas, Lawrence, Kansas.

Will collect in all orders except Lepidoptera, in exchange for Cerambycidae (longicorn beetles) and Pentatomidae (stink-bugs). G. Chagnon, P. O. Box 521, Montreal, Canada.

I will collect Coleoptera and Lepidoptera in southwest Arkansas for those so interested.—Miss Louise Knobel, 417 West 2nd Avenue, Hope, Arkansas.

Correspondence solicited from anyone desiring general collections of insects, to be made in Costa Rica. Austin Smith, Apartado 412, San José, Costa Rica.

Wanted—Am working on a Revision of the Buprestidae of the West Indies and would like to examine any material in this family from that region. W. S. Fisher, U. S. National Museum, Washington, D. C.

For Exchange—A large number of Papilio Turnus, P. Cresphontes and P. Ajax pupae, or the same specimens in papers, for other pupae or Lepidoptera. Carl Selinger, 4419 Dover St., Chicago, Ill.

Wanted—Dytiscidae not in my collection, in exchange for local specimens. Offer Coelambus sellatus, Oregonus, etc. F. S. Carr, 11050 123rd St., Edmonton, Alberta.

Coleoptera for exchange—Cicin. generosa, hirticollis, modesta, sexguttata, 12-punctata, Saperda populnea, Uro. fasciata, Donacia subtilis, palmata, texana-minor, biimpressa, refuscens. Ernest Baylis, 5011 Saul St., Philadelphia, Pa.

Endomychidae. I desire to purchase representatives of this family from any part of the world. Particularly desire specimens from the western and southwestern part of the U. S. L. B. Walton, Kenyon College, Gambier, Ohio.

Buprestidae, Cleridae and **Carabinae** wanted from U. S. or Buprestidae of the world. Will collect insects of any group (except Lepidoptera) in exchange or pay cash. Alan S. Nicolay, 416a Grand Ave., Brooklyn, New York.

Lepidoptera. Hesperiidae (Skipper-butterflies). Will purchase, exchange or name specimens. North or South America. Pamphila comma group particularly desired. Henry Skinner and R. C. Williams, Jr., Address Academy of Natural Sciences, Logan Square, Philadelphia, Pa.

RECENT LITERATURE

FOR SALE BY

THE AMERICAN ENTOMOLOGICAL SOCIETY

1900 RACE STREET, PHILADELPHIA, PA.

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